10G EPON OLT SFP+ 1577nm-Tx/1270nm-Rx and 1490nm-Tx/1310nm-Rx PR30 20km DOM SC SMF Optical Transceiver Module (Industrial)

10ESFP-52-PR30-I

Application

- Access Network

Features

- Single Fiber, Integrated Triplexer Transceiver
- Support IEEE802.3 2018 10Gbase PR30-D 10GEPON OLT
- Support IEEE802.3 2018 1000Base-PX30 EPON OLT
- Integrated with Micro-optics WDM Filter
- 1577nm Continuous-mode Transmitter with EML Laser
- 1490nm Continuous-mode Transmitter with DFB Laser
- Optional Supported 1270nm/1310nm Burst-mode Receiver with APD-TIA
- Digital Diagnostic SFF-8472 Compliant
- +3.3V Power Supplies
- Operating Case Temperature:
  Comercial Temp 0 to 70 ºC
  Extended Temp -20 to 80 ºC
  Industry Temp -40 to 85 ºC
- 20km Transmission
- RoHS with Exemption

Description

The EPON ONU SFP transceiver provides up to 10.3125G-TX/10.3125G-RX and 1.25G-TX/1.25G-RX up to 20km over single-mode fiber (SMF) using a wavelength of 1577nmTx/1270nmRx and 1490nmTx/1310nmRx via an SC/UPC connector. It can operate at temperatures between -40° C and 85° C. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. It is fully compliant with IEEE802.3 2018 PR30 20km application and RoHS standards and is ideal for 10G EPON system and FTTx applications.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature Range	Ts	-40	85	℃	
Operating Temperature	Tc	0	70	° C	
Operating Temperature	Tc	-20	80	° C	
Operating Temperature	Tc	-40	85	°C	
Relative Humidity	RH	5	85	%	
Supply Voltage	V_{CC}	0	3.6	V	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	$V_{CC}3$	3.135	3.3	3.465	V	
Power Consumption	Pwc		2.5	2.5	W	1
	Pwe			3	W	2
	Pwi			3	W	3
Transmission Distance				20	km	
Operating Temperature (Case)	Topr	0	-	70	ºC	

Operating Case Temperature	Tc	-20		80	° C	
Operating Case Temperature	Tc	-40	-	+85	° C	

Notes:
1. 0~70 ºC
2. -20~80 ºC
3. -40~85 ºC

III. Optical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
10G Transmitter						
Transmitter Signal Rate		Gbps		10.3125		
Centre Wavelength	λc	nm	1575	1577	1580	
Optical Spectrum Width (-20dB)	△λ	nm			1	
Side Mode Suppression Mode	SMSR	dB	30			
Average Launch Power	POUT	dBm	2		5	
Average Launch Power-OFF Transmitter	POFF	dBm			-39	
Extinction Ratio	ER	dB	6			2
Optical Eye Mask	Compliant With IEEE Std 802.3 2018 section5					2,4
1G Transmitter						
Transmitter Signal Rate		Gbps		1.25		
Centre Wavelength	λc	nm	1480	1490	1500	
Side Mode Suppression Mode	SMSR	dB	30			
Average Launch Power	POUT	dBm	3		7	
Average Launch Power-OFF Transmitter	POFF	dBm			-39	

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Extinction Ratio	ER	dB	9			5
Optical Eye Mask	Compliant With IEEE Std 802.3 2018 section5					5,6
10G Receiver						
Transmitter Signal Rate		Gbps		10.3125		
Operating Wavelength	λC	nm	1260		1280	
Sensitivity(BOL)	PSEN	dBm			-28	7
Saturation	PSAT	dBm	-6			
Loss of Signal Assert	PLOSA	dBm	-45	-	-	
Loss of Signal Deassert	PLOSD	dBm			-29	
1G Receiver						
Operating Wavelength	λC	nm	1260	1310	1360	
Sensitivity	PSEN	dBm			-29.78	8
Saturation	PSAT		-9.38			
Loss of Signal Assert	PLOSA	dBm	-45	-	-	
Loss of Signal Deassert	PLOSD	dBm			-30	

Notes:

1. The optical power is launched into 9/125um SMF.
2. Measured with PRBS 2^31- 1 test pattern @10.3125Gbps.
3. Measured with the Bessel-Thompson filter OFF.
4. Transmitter eye mask definition {0.25UI, 0.40UI, 0.45UI, 0.25UI, 0.28UI,0.40UI}.
5. Measured with PRBS 2^7- 1 test pattern @1.25Gbps.
6. Transmitter eye mask definition {0.22UI, 0.375UI, 0.20UI, 0.20UI, 0.30UI}.
7. Measured with a PRBS 2^31- 1 test pattern @10.3125Gbps and ER=6dB, BER =10^-3
8. Measured with a PRBS 2^7- 1 test pattern @1.25Gbps and ER=9 dB, BER=10^- 12

Ⅳ. Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
10G Transmitter						
Time to Initialize	t_start_up	ms	-	-	300	1
Data Input Differential Swing	VIN	mVp-p	120		800	
Input Differential Impedance	ZIN	Ω	80	100	120	
Transmitter Disable Voltage - Low	VTDIS,L	V	0		0.8	2
Transmitter Disable Voltage - High	VTDIS, H	V	2.0		Vcc	2
1G Transmitter						
Data Input Differential Swing	VIN	mVp-p	200		1600	3
Input Differential Impedance	ZIN	Ω	90	100	110	
Transmitter Fault Indication Voltage – Low	VTFI, L	V	0		0.4	
Transmitter Fault Indication Voltage - High	VTFI, H	V	2.4		Vcc	
10G Receiver						
Data Output Differential Swing	VOUT	mVP-P	400		800	4
Loss of Signal Detected Voltage - Low	Vlos,L	V	0		0.8	5
Loss of Signal Detected Voltage - High	Vlos, H	V	2.4		VCC3	
Loss of Signal Assert Time	TLOSA	ns			1024	
Loss of Signal Deassert Time	TLOSD	ns			512	
Output Differential Impedance	Rout	Ω	80	100	120	
1G Receiver						
Data Output Differential Swing	V_{OUT}	mV_{P-P}	1200		1600	6
Loss of Signal Detected Voltage - Low	$V_{los,L}$	V	0		0.4	
Loss of Signal Detected Voltage - High	$V_{los,\ H}$	V	2.4		V_{CC3}	

Parameter	Symbol	Unit	Min.	Typ.	Max.	Note
Loss of Signal Assert Time	T_{LOSA}	ns			1024	
Loss of Signal Deassert Time	TLOSD	ns			512	
Output Differential Impedance	Rout	Ω	80	100	120	

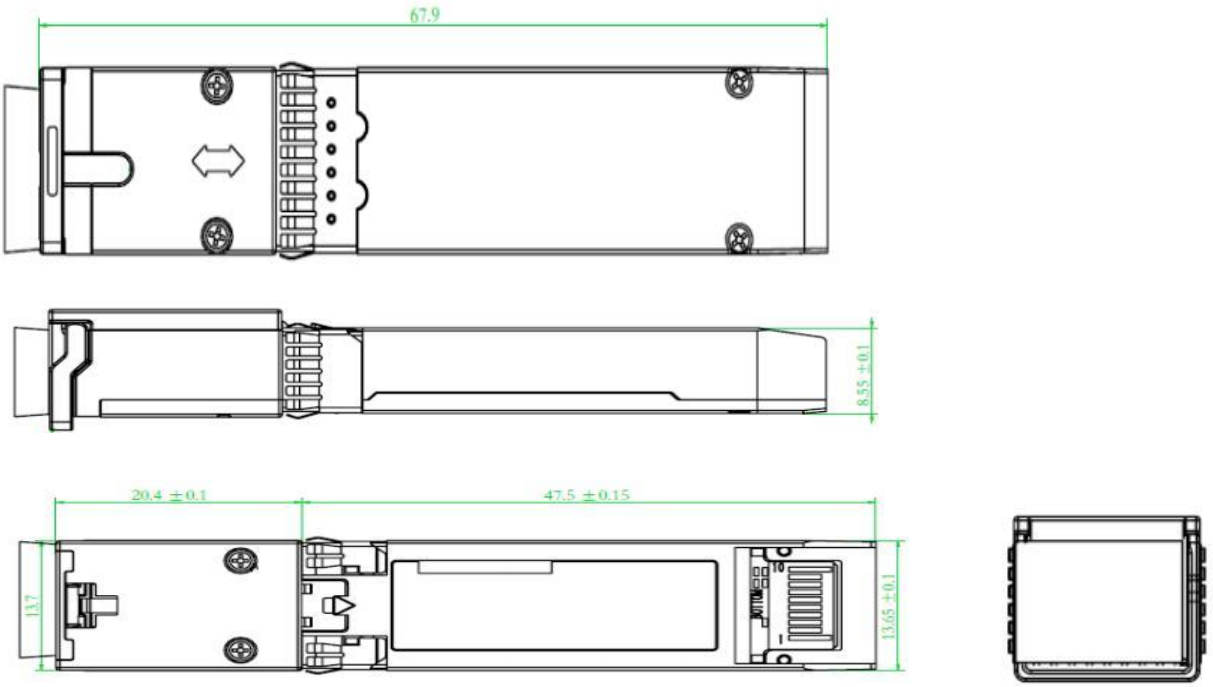
Notes:
1. Compatible with CML input, AC coupled internally.
2. Tx_Disable
3. Compatible with LVPECL input, AC coupled internally.
4. Compatible with CML Output, AC coupled internally. guaranteed in the full range of input optical power
5. LOS
6. Compatible with LVPECL Output, DC coupled internally. guaranteed in the full range of input optical power

V. Pin Function Definitions

Pin	Symbol	Logic
1	1G_TD+	CML/LVPECL
2	1G_TD-	CML/LVPECL
3	GND	
4	SDA	LVTTL
5	SCL	LVTTL
6	1G_RD-	
7	NC	
8	LOS	
9	Trigg/Txdis	LVTTL
10	1G_RD+	LVTTL
11	GND	
12	10G_RD-	CML
13	10G_RD+	CML

Pin	Symbol	Logic
14	Tx_Fault	LVTTL
15	Vcc3_Rx	
16	Vcc3_Tx	
17	NC	
18	10G_TD+	CML
19	10G_TD-	CML
20	GND	

Ⅵ. Mechanical Diagram



Units:mm
Figure 4, Product outline Drawing
(Notes: 20.4±0.05 is exceeding SFF-8432 A dimension)

Ⅶ. Order Information

Part Number	Description
10ESFP-52-PR30-I	10GEPON OLT SFP+ 1577nm-Tx/1270nm-Rx and 1490nm-Tx/1310nm-Rx PR30 20km DOM SC SMF Optical Transceiver Module (Industrial, 20PIN)
10ESFP-25-PR30-I	10GEPON ONU SFP+ 1270nm-Tx/1577nm-Rx 10.3125G-TX/10.3125G-RX PR30 20km DOM SC SMF Optical Transceiver Module (Industrial, 20PIN)
ESFP-43-20PX30-I	EPON OLT 1000BASE-PX30 SFP 1490nmTx/1310nmRx 20km DOM SC SMF Optical Transceiver Module (Industrial, 20PIN)
ESFP-43-20	EPON OLT SFP 1490nm-TX/1310nm-RX 1.25G-TX/1.25G-RX 20km DDM SC SMF Transceiver Modules
ESFP-34-20N-I	EPON ONU SFP 1310nm-TX/1490nm-RX 1.25G-TX/1.25G-RX PX20+ 20km DDM SC SMF Optical Transceiver Module (Industrial)